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Officials turn to Sandia National Labs for help on huge sinkhole

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The 300-foot-wide sinkhole that has threatened since August to swallow gas pipelines, homes and property in south Louisiana has drawn in experts from a national laboratory normally associated with nuclear research to figure out its cause.

Experts are trying to determine what caused the sinkhole to form and expand in Assumption Parish's Bayou Corne that threatened property and infrastructure in the area. Louisiana Governor Bobby Jindal declared a state of emergency for the area on Aug. 3. When the sinkhole continued to expand during the week of Aug. 13, parish law enforcement officials said 150 homes and 350 residents were forced to evacuate. The company that owns the site, Texas Brine, LLC, said on Sept. 27 that it is still analyzing the crater's site and looking for a cause.



*Bayou Corne sinkhole
in August*

Sandia National Labs said in Sept. 26 Blog post that the manager of the lab's Geotechnology and Engineering Department, David Borns is providing technical evaluations in weekly teleconferences about possible causes and remedies for the sinkhole. The National Geological Survey, known for its seismic expertise, asked Sandia to consult on the evaluations.

"We try to be of support to adding expertise to federal and local governments when they're faced with understanding technical issues that impact their resources," said Borns.

Authorities have been trying to determine whether the sinkhole was caused by the collapse of an abandoned brine mining cavern along the margin of the Napoleonville Salt Dome or by something else. Texas Brine has drilled a borehole into the cavern at a depth of 3,500 feet to learn whether the cavern is the cause. The results of the drilling will determine what the technical evaluation committee recommends, Borns said.

The sinkhole opened up overnight on Aug. 2 off the western edge of the salt dome near Bayou Corne. Although it was reportedly originally about 300 feet deep, Borns said only one part was that deep and the rest was about 50 feet deep.

"There were some broad impacts to the area," he said. "A nearby community was evacuated, this big sinkhole formed, and it forced the closure of a two major natural gas pipelines," he said in the blog post.

According to the Sandia blog post, the USGS had been keeping an eye on the area because of harmonic tremors that began in June, said the Sandia post, along with gas bubbling up at seven different locations in the wetlands of Bayou Corne and nearby Grand Bayou.

"What they were seeing was some sort of fluid movement through fractures, which they thought might be the natural gas that was bubbling up in the bayou," Borns said.

Authorities first thought the source might be a broken pipeline, but all pipelines checked out, said Sandia. Then they started exploring whether something was happening within the caprock or surrounding sediments where natural gas comes from, it said. The harmonic tremors continued for about six weeks but stopped after the sinkhole formed, said Borns, adding that since then, only small seismic events continue to be recorded near the cavern under investigation.

The cavern was developed for brining operations, in which companies dissolve salt to extract chlorine for use as a precursor for petrochemicals, he said.

On Aug. 22, the Louisiana Governor's Office of Homeland Security and Emergency Preparedness formally asked Energy Secretary Steven Chu for help from Sandia. The Labs previously worked on cavern collapse and sinkhole formation problems on Weeks Island, LA. Borns said Sandia experts are called in once or twice a year to study similar concerns.

According to Sandia, the USGS had suggested the state of Louisiana include Sandia on technical conference calls based on the Labs' expertise in salt and salt caverns. Sandia began working on salt formations in the 1970s, investigating the geomechanical response of salt caverns as a potential medium for underground nuclear weapons testing, Borns said. About the same time, some authorities proposed using underground nuclear shots in salt to create storage caverns for natural gas, he said.

Sandia's studies of salt mechanics led to decades of research on the Strategic Petroleum Reserve, which has two locations in Louisiana and two locations in Texas, and on the Waste Isolation Pilot Plant, or WIPP, which stores radioactive waste from defense programs in rooms excavated in ancient salt beds near Carlsbad, N.M.

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